

APPENDIX M

PARAMETERS FOR THE SEA DRAGON

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PARAMETERS FOR THE SEA DRAGON, THE PROPOSED CABLE PLOW FOR SEA CABLE BURIAL

SPECIFICATIONS

Manufacturer:	Oceaneering
Type:	Telecom / Power Cable Plow
Rated Water Depth:	1,000 meters
Tow Tension:	10 - 20 Ton Bollard Pull
Deployment Style:	Knuckle Crane
Dimensions:	
Length:	8.0 meters
Width:	4.0 meters
Height:	2.5 meters
Weight:	12.5 Tons
Burial:	Burial Depth:
Maximum:	1.2 meters
Diam. of object 10mm to 68mm	1.1 meters
Diam. of object 70mm to 370mm	0.6 meters

Additional Information:

Top Side Equipment: The SEA DRAGON Plow System is self-contained, including 20 foot ISO containers housing an Operations Control Van; diesel operated Hydraulics Power Units for topside launch and recovery and tow winch; maintenance van; and spares van. An A-frame capable of assembly on a ship of opportunity, tow winch, and control umbilical winch also comprise the SEA DRAGON System. The attached control panel display is the primary view that the operator uses to monitor and control plow functions during cable burial operations.

Hydraulic Power: The skids, depressor, camera pan and tilts, release mechanisms, and thruster are powered by a 10 HPU hydraulic power pack.

Skids: Two hydraulic, actuated independently, adjustable skids; one on either side of the plow body. The skids are controlled from the topside console, allowing the operator to control the cable burial depth and the stability of the plow. Instrumentation on the skids monitors the skid extension/retraction depth, allowing cable burial depth to be adjusted as soil conditions change.

Tow Point: An instrumented tow point attaches to the bow of the plow, allowing real time readout of the tow tension and tow angle.

Lift Point: The lift point is over the center of gravity, allowing the plow to perform flyovers and for use for launch and recovery.

Cable Depressor: The cable depressor is instrumented to provide continuous monitoring of the cable burial depth during the plowing operation. Resolving the difference between the bottom of the skids and the cable depressor position will provide true cable depth below the surrounding seabed. The depressor is also instrumented to indicate continuous capture status of the cable, and as-laid residual tension of the cable.

Plow Instrumentation: The plow is equipped with a sensor suite, which enhances the plow capability. The sensors' information is transmitted to the surface by the electro-optical umbilical cable. The sensor package is the same one Oceaneering used in over 30 of its Remotely Operated Vehicles around the world.

The plow sensor package includes the following:

- a) Obstacle Avoidance Sonar
- b) 4 Cameras — 1 SIT pan & tilt looking forward; 1 ICCD looking inside the cable highway, and 2 relocatable cameras
- c) 5 Flood Lights
- d) Skid Depth Sensor
- e) Sensor for Plow Tow Force
- f) Water Depth
- g) Heading
- h) Pitch and Roll
- i) Plow Depressor Depth
- j) Hydraulic Pressure Gauge
- k) Electrical Voltage and Current
- l) Tracking Responder
- m) Tow Angle
- n) Cable Capture Status and Residual Cable Tension